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# Understanding Note Frequency Charts (And Why You Should Be Using One)

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A note frequency chart lists the 12 notes of the Western scale and their corresponding frequencies in Hz across octaves. Charts like these are very easy to read, and while it isn't a requirement to keep Produce Like A Pro® (<https://producelikeapro.com/blog/>) Understanding Note Frequency ...

one nearby at all times, they can be useful under certain circumstances.

# What Is a Frequency

A frequency is a representation of pitch measured by Hz. Hertz represent how many times a sound wave vibrates in one second. So a note measured at 440 Hz completes 440 vibrations per second. Slow vibrations, or lower values, result in deeper pitches, while faster vibrations (higher values) sound higher.

A piano string, for example, vibrates at a specific frequency, or pitch, based on its length and tension. Every note on the keyboard corresponds to a specific frequency based on how the string vibrates inside the instrument. So a longer string with more slack is going to vibrate slower and have a lower pitch than a shorter string that is tightly stretched.

## How is a frequency calculated?

The simplest equation for calculating frequency is  $f=1/T$ . Frequency equals the number of cycles divided by the time it takes to complete said cycles. For example, if you wanted to determine the frequency of a wave that completes 360 cycles in 1 minute, your equation would look like this:  $f=360/60s = 6 \text{ Hz}$ .

There are few instances where you'd need to use this sort of equation in the studio, but in acoustics, for example, you can calculate the frequencies of room modes/standing waves based on the dimensions of your walls. A frequency whose wavelength equals that of your wall can cause acoustic problems. We won't get into that here, but we'd encourage you to reference these [formulas](https://www.omnicalculator.com/physics/frequency) (<https://www.omnicalculator.com/physics/frequency>) for calculating frequency.

One final (useful) note about frequency and calculations. If you know the fundamental frequency of a note, you can easily calculate its higher and lower octaves. Multiply or divide the fundamental by two to find the next higher or lower octave respectively. So if 440



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Hz (A) is our fundamental, and you want to find the frequency of the next octave up, multiply by two = 880 Hz. One octave below 440 Hz is 220 Hz.

## What is equal temperament?

Equal temperament is a tuning system devised by mathematics. It's the standard for Western music. The equal temperament system dictates that there are 12 pitches per octave with equal spacing between. First, there needs to be a set standard on which to base the measurements, which is usually A4, or 440 Hz. From there, a logarithmic equation is used to determine the rest of the pitches relative to A440Hz.

## Why Matching Musical Notes to Frequencies Is Useful

| NOTE FREQUENCY CHART   HEROIC AUDIO |          |          |          |          |          |          |          |          |          |          |           |
|-------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
|                                     | Octave 0 | Octave 1 | Octave 2 | Octave 3 | Octave 4 | Octave 5 | Octave 6 | Octave 7 | Octave 8 | Octave 9 | Octave 10 |
| C                                   | 16.35    | 32.70    | 65.41    | 130.81   | 261.63   | 523.25   | 1046.50  | 2093.00  | 4186.01  | 8372.02  | 16744.04  |
| C#                                  | 17.32    | 34.65    | 69.30    | 138.59   | 277.18   | 554.37   | 1108.73  | 2217.46  | 4434.92  | 8869.84  | 17739.69  |
| D                                   | 18.35    | 36.71    | 73.42    | 146.83   | 293.66   | 587.33   | 1174.66  | 2349.32  | 4698.64  | 9397.27  | 18794.55  |
| D#                                  | 19.45    | 38.89    | 77.78    | 155.56   | 311.13   | 622.25   | 1244.51  | 2489.02  | 4978.03  | 9956.06  | 19912.13  |
| E                                   | 20.60    | 41.20    | 82.41    | 164.81   | 329.63   | 659.26   | 1318.51  | 2637.02  | 5274.04  | 10548.08 |           |
| F                                   | 21.83    | 43.65    | 87.31    | 174.61   | 349.23   | 698.46   | 1396.91  | 2793.83  | 5587.65  | 11175.30 |           |
| F#                                  | 23.12    | 46.25    | 92.50    | 185.00   | 369.99   | 739.99   | 1479.98  | 2959.96  | 5919.91  | 11839.82 |           |
| G                                   | 24.50    | 49.00    | 98.00    | 196.00   | 392.00   | 783.99   | 1567.98  | 3135.96  | 6271.93  | 12543.86 |           |
| G#                                  | 25.96    | 51.91    | 103.83   | 207.65   | 415.30   | 830.61   | 1661.22  | 3322.44  | 6644.88  | 13289.75 |           |
| A                                   | 27.50    | 55.00    | 110.00   | 220.00   | 440.00   | 880.00   | 1760.00  | 3520.00  | 7040.00  | 14080.00 |           |
| A#                                  | 29.14    | 58.27    | 116.54   | 233.08   | 466.16   | 932.33   | 1864.66  | 3729.31  | 7458.62  | 14917.24 |           |
| B                                   | 30.87    | 61.74    | 123.47   | 246.94   | 493.88   | 987.77   | 1975.53  | 3951.07  | 7902.13  | 15804.26 |           |

Drummers will find this practice useful for tuning their kits. Knowing the exact frequency of any given pitch will help them suit the key of the song and create a musical sounding arrangement of pitches between the various parts of the drum set.

It can also be useful for mixing low-end. Let's say you have an 808 or sub bass and you want to emphasize the fundamental frequency. If you know that the 808 is tuned to C, you can



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reference your note frequency chart and find 64 Hz and 128 Hz as two C notes in the low-end range you might want to emphasize so that it has a bit more audible bass to it.

# Using a Note Frequency Chart to Achieve a Crisp, Clean Mix

A note frequency chart is just a reference to help you assign “names” to certain frequencies. If you’re trying to find resonances that are clashing with the key content of a song, then using a note frequency chart might help you find “out of key” frequencies and attenuate those as needed. But it’s important to remember that any fundamental frequency is also made up of rich harmonics, or overtones, that create the overall timbre. You don’t want to get too carried away notching every frequency just because it doesn’t fit in the key, for instance.



A note frequency chart is likely more useful for emphasizing fundamentals in certain circumstances, such as with a big, flabby sub bass. You can give it a bit of context by enhancing its fundamental(s).

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